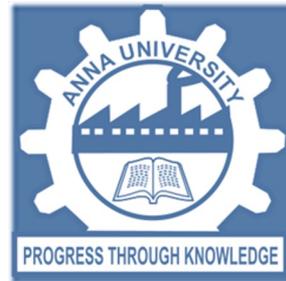


Impact assessment of partially desilted minor irrigation tanks in Tiruvannamalai, Tirunelveli and Krishnagiri districts



by

Centre for Water Resources

Anna University, Chennai – 25

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Objectives of the study

1. To study the impact of water conservation measures through:

- Increase in storage capacity of the tank
- Improvement in groundwater potential
- Improvement in crop related parameters
- Increase in income from agriculture and livestock

2. Changes in the socio-economic status of the farmers

3. Suggest measures to improve the project performance

Team



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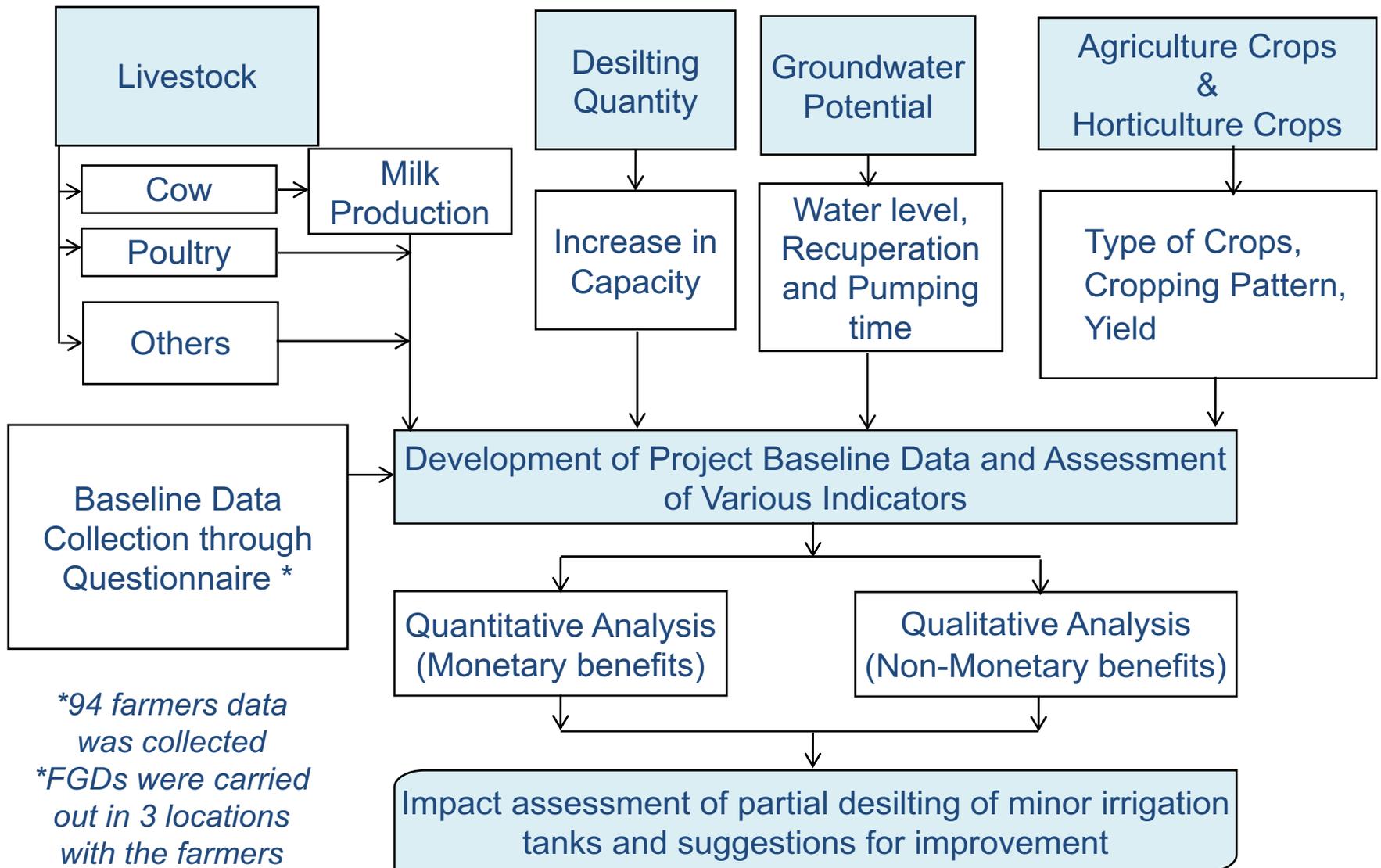


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Methodology



Selection of Tanks

The tanks were selected based on:

- Agro-climatic region
- Rainfall
- Hydraulic particulars
- Benefits to the community and
- People participation

The three minor irrigation tanks selected for the post evaluation study:

1. Sadhuperipalayam tank, Sadhuperipalayam Panchayat in Tiruvannamalai district
2. Vettaikarankulam tank, Puliyurkurichi Panchayat in Tirunelveli district
3. Beerjepalli tank, Beerjepalli Panchayat in Krishnagiri district

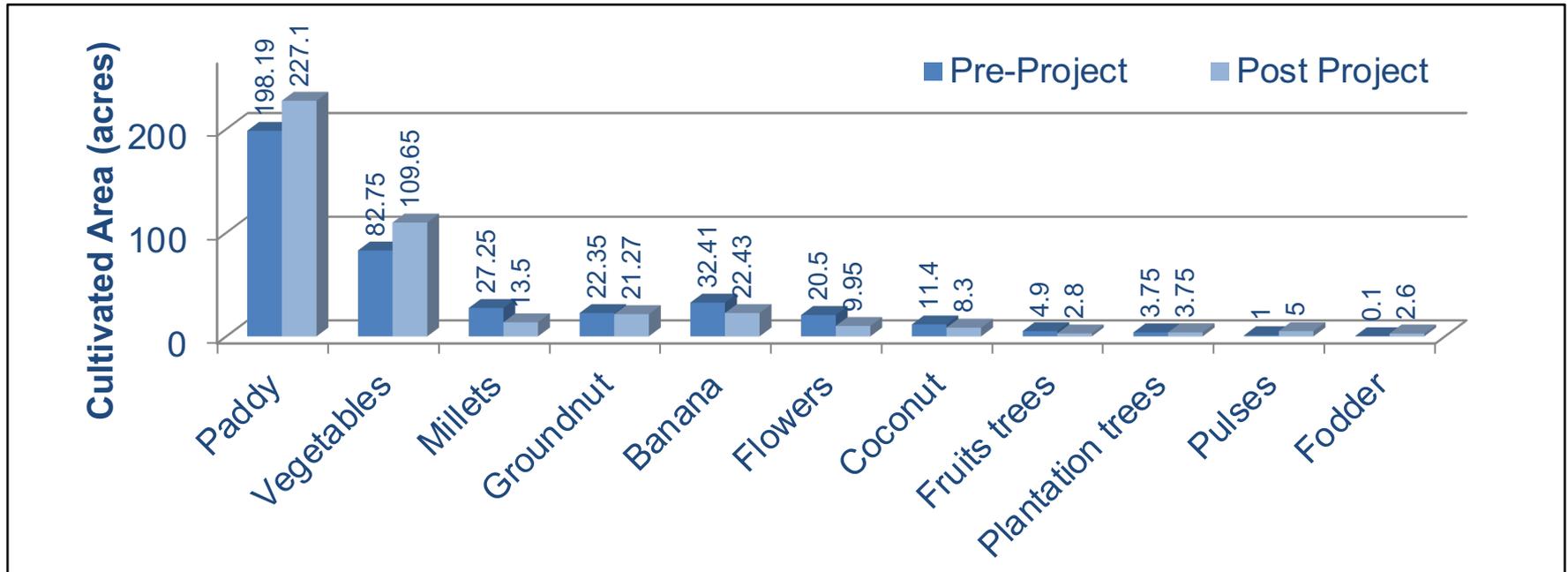
Details of tank	Sadhuperipalayam tank	Vettaikarankulam tank	Beerjepalli tank
Number of beneficiary farmers	119	100	51
Number of open wells around the tank	74	20	15
Number of bore wells	25	35	38
Ayacut area (ha)	22	20	16
Water spread area (ha)	8	17	13
Storage depth after desilting (m)	2	2.4	2.5
Original capacity of the tank (m ³)	1,31,000	2,43,900	1,20,000
Partially restored capacity (m ³)	6,599	7,500	14,668
Year of desilting	2019-20	2020-21	2019-20

Pumping hours plotted for the bore and open wells

Type of well	Bore well				Open Well			
	Krishnagiri (n=29)		Tiruvannamalai (n=19)		Tirunelveli (n=20)		Tiruvannamalai (n=15)	
Parameters	Pre-Project	Post Project	Pre-Project	Post Project	Pre-Project	Post Project	Pre-Project	Post Project
Water Level (feet)	586.5	21.73	208.8	20.69	23.35	22.85	33.33	11.8
Pumping hours (hours)	3.51	1.95	2.07	1.55	2.39	2.13	2.49	1.93
Recuperation time (hours)	8.76	6.01	4.02	4.29	4.51	4.64	5.26	5.44

- The **pumping hours has reduced** in the post project period indicating improvement in the groundwater level due to availability of water in the tank.
- The **recuperation time has reduced** in Krishnagiri.

Change in crop cultivated area

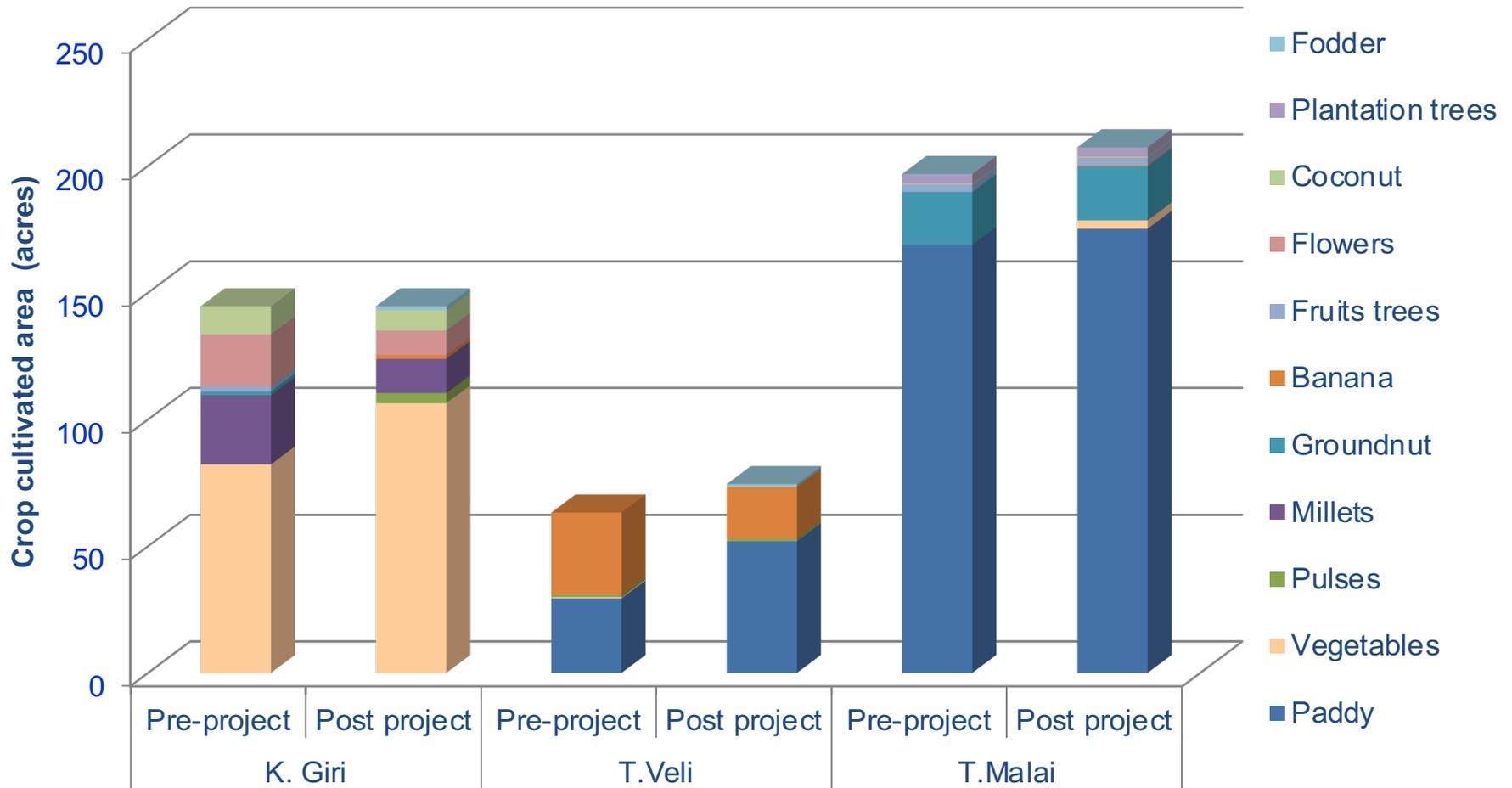


- **Area under cultivation**

- Paddy - **15%** ↑
- Vegetables - **33%** ↑
- Millets, flowers, bananas, fruit trees, and coconut ↓
 - Millets which are grown normally in dry and rainfed land, cultivated prior to the project intervention in more than 27 acres have come down to 13.75 acres, a **50% reduction**.

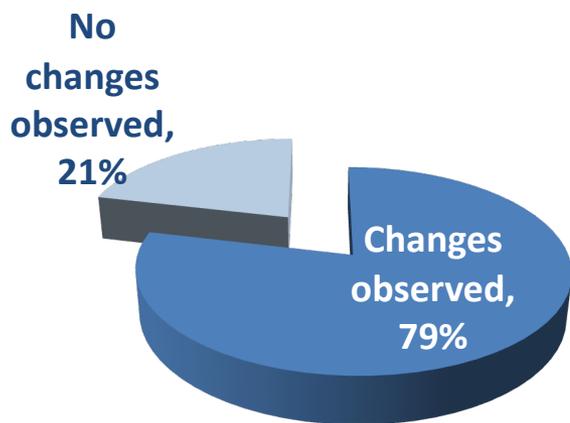
- **Water availability likely has encouraged farmers to go for more high income water intense crops, marigolds, beans and avarai instead of millets.**

Change in crop cultivated area - district wise

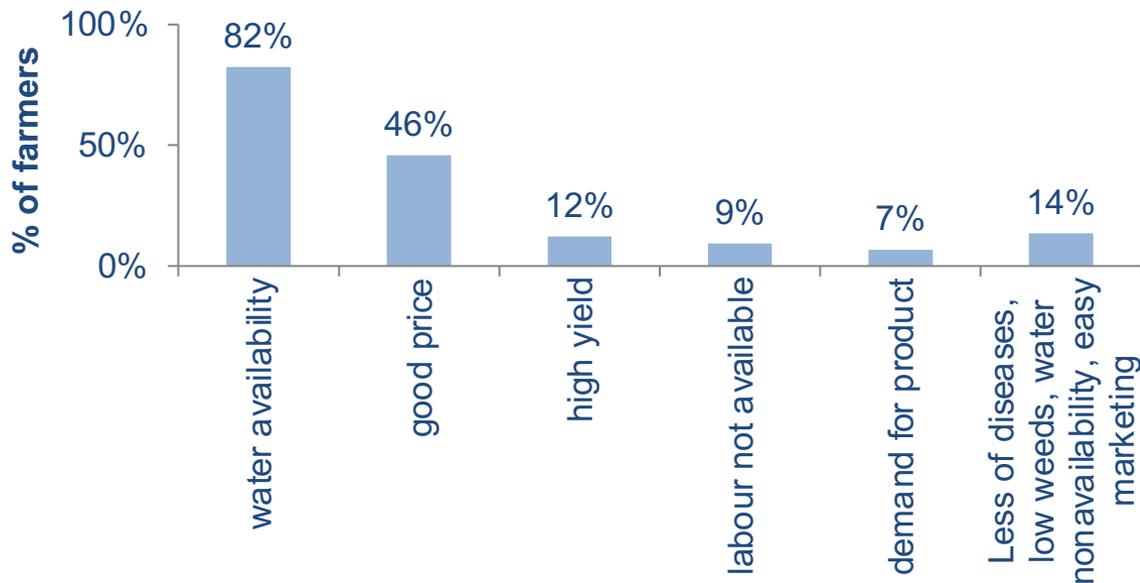


- **Increase in the crop cultivated area under paddy by 15% in Tiruvannamalai and Tirunelveli**
- **Increase in the crop cultivated area under vegetable by 29% in Krishnagiri district**

Change in cropping pattern



Reasons for changes in the crops cultivated



- Among the 94 farmers, 74 (**79%**) **adopted some changes in the cropping pattern**; cultivation in one more season, bringing more area under cultivation, shifting to another new crop, adopting organic micro irrigation systems, or adopting machines in their farm work.
- **Availability of water** was one major reason mentioned by **82%** of farmers for opting to change their cropping pattern.
- Besides water availability, a good price for the produce was the second most common reason for a crop change.

Livestock Population

Districts and Category	Pre-project			Post-project		
Cow	Local varieties	Cross-hybrid	Total	Local varieties	Cross-hybrid	Total
Krishnagiri	22	43	65	5	28	33
Tirunelveli	2	16	18		18	18
Tiruvannamalai	23	49	72	11	39	50
Overall	47	108	155	16	85	101
Poultry						
Krishnagiri	92		92	7		7
Tiruvannamalai		3503	3503	109	2300	2409
Overall	92	3503	3595	116	2300	2416
Other livestock						
Krishnagiri	52	65	117	20	43	63
Tirunelveli	3	89	92		147	147
Tiruvannamalai	109	80	189	22	69	91
Overall	164	234	398	42	259	301

- It is observed that there is a **decline in terms of livestock population** in all the districts.
- This may be attributed to the increase in the cost of manpower, the mortality rate due to diseases, the lack of veterinary hospitals and other maintenance requirements.

**other livestock includes goat, sheep, pig and duck*

Macro Level - Net Income from agri and livestock

n = 94 households

	Krishnagiri (n = 31)			Tiruvannamalai (n = 32)			Tirunelveli (n=31)		
(Rs. in lakhs)	Pre-project	Post-project	% increase	Pre-project	Post-project	% increase	Pre-project	Post-project	% increase
Total net income from agri and livestock	83.9	118.2	40.9%	38.1	52.8	38.39%	53.3	79.6	49.36%
Total net income from agri and livestock – <u><i>inflation adjusted</i></u>	98.8	118.2	19.7%	44.9	52.8	17.6%	62.7	79.6	26.9%

- **Considering all the households, the inflation adjusted increase in net income** were 19.7%, 17.6% and 26.9 % for Krishnagiri, Tiruvannamalai and Tirunelveli respectively.

Note: Two-third of the households either reported decline or had incomes < Rs. 1 lakh

Impact

- The partial desilting of tanks has made water available for **more than one cropping season** in all three districts and hence farmers are cultivating more.
- Increase in the water availability have encouraged farmers to go for more high income and high water requirement crops such as paddy, marigold, beans and avarai instead of rainfed crops like millets.
- The desilting of minor irrigation tanks carried out by SST has made a good impact in **increasing the water storage** and thereby **recharging** the sources of irrigation like bore wells and open wells.

Recommendations

- Baseline data needs to be collected before starting the work using a questionnaire at least for a period of six months.
- The water level and water quality data have to be collected from both the tank and wells in the ayacut area for the impact evaluation. The water level data may be collected every 15 days during the monsoon and 30 days during non-monsoon seasons.
- Since only partial desilting is possible considering the quantum of silt that can be removed, suitable locations in the tank may be identified. This can be done by conducting the infiltration test at different places to increase the tank capacity and maintain the steady flow of recharge to the nearby wells for the entire crop period.

Recommendations

- The soil excavation pit in the tank bed should be located safely away from the toe of the bund. The safe distance may be kept at ten times the bund height.
- Quality control reports for the earthwork and concrete works may be obtained from government organisations such as PWD QC labs, colleges and polytechnics at various stages of the work execution.
- For the tank to store enough water and cater for the needs of the village, the tank bund, supply channel and surplus weir are needs to be properly maintained. It is observed that the SST has mostly carried out the desilting and bund strengthening works and in a few places, supply channel work is also taken up. Since the supply channel and surplus weir are also important for the inflow and outflow, these two components are also can be taken up in the future wherever it is necessary on the field.

Recommendations

- The WMC should consist of members from elected representatives, farmers and people. The work satisfaction report should be obtained from the WMC at different levels of work progress. Also, WMC should be converted into Water Management Committee or farmers' interested group or society to maintain the tank to serve its purpose.
- Wherever the work is carried out in the tank, a display board with all details should be kept in masonry, so that people will know the details of the work and duplication of work from some other agency may also be avoided.
- Once a formal body is established, necessary capacity building has to be provided for them to carry out the responsibilities of maintaining the tank.
- More farmers' training programmes to impart sustainable farming practices have to be made as part of SST's community level interventions.
- The Management Committee should generate/collect money from the farmers, fish revenue and people to carry out the O&M work where the outside agencies like SST also can support.

Thank You

